STATEMENT OF BASIS/FINAL DECISION AND RESPONSE TO COMMENTS SUMMARY

Region III
ID# 7926

Merck & Company, Inc.

West Point, Pennsylvania
Signed August 13, 1993

Facility/Unit Type:	**Manufacturing and research of pharmaceuticals**
Contaminants:	**Chloroform, methylene chloride, methyl chloride, tetrachloroethene, trichloroethene, trichlorofluoromethane, vinyl chloride, 1,1-dichloroethene, 1,2-dichloroethene(cis/trans), 1,2-dichloroethane (DCA), 1,1,1-trichloroethane (TCA)**
Media:	**Ground water, soil**
Remedy:	**Pumping and treating contaminated ground water, in situ vapor extraction from unsaturated bedrock (treatment method for vapor residual to be determined)**

FACILITY DESCRIPTION

On January 20, 1989, EPA and Merck & Company entered into an Administrative Consent Order pursuant to Section 7003 of RCRA which required Merck to complete a hydrogeological study to determine the nature and extent of releases of hazardous waste and hazardous waste constituents and to evaluate corrective measure alternatives to address contamination at the facility.

The 400-acre Merck & Company site is a pharmaceutical manufacturing and research facility located 1 mile south of Landsdale, in Upper Gwynedd Township, Montgomery County, Pennsylvania. The land surrounding the site is predominantly residential, with many homes utilizing domestic ground-water wells as a principle source of drinking water. Merck operated a landfill at the facility from the 1950s to 1973 which has not been operational since then. Samples taken from private ground-water wells and soil surrounding the facility indicated the presence of various contaminants, including chloroform, methylene chloride, methyl chloride, tetrachloroethene, trichloroethene, trichlorofluoromethane, vinyl chloride, 1,1-dichloroethene, 1,2-dichloroethene (cis/trans), 1,2-DCA, and 1,1,1-TCA.

Since 1980, Merck has implemented several activities to stabilize contaminated soils and ground water at the facility. These activities included soil excavation at six separate areas; performing in situ vapor extraction from three separate areas; commencement of ground-water pumping and treatment via Granular Activated Carbon (GAC) treatment presently from seven pumping wells; and collection and GAC treatment of ground water from two shallow wells (converted from in situ soil vapor extraction vents) and from two sumps. Contaminants in the unsaturated bedrock are also being remediated in three areas using in situ vapor extraction. In addition, a total of approximately 6,445 cubic yards of contaminated soil has been removed and disposed of offsite in a hazardous waste landfill in accordance with EPA regulations.

There are approximately 59 private wells located within 2,500 feet of the facility which have been periodically tested for contaminants by both Merck and EPA. In addition, there are three streams in which warm-water fishes are present (Wissahickon, Towamencin, and Zacharias Creeks) within a 1-mile radius of the facility. Merck, under an NPDES permit, currently discharges storm water into the Towamencin and Zacharias creeks. Under this permit, Merck is required to test periodically for chloroform and other contaminants. The concentration of chloroform in surface water samples has been lower than the MCL and Aquatic Water Quality Criteria (40 CFR Part 131).

CONTAMINATION DETECTED AND CLEANUP GOALS

Media	Estimated Volume	Contaminant	Maximum Concentration	Action Level	Cleanup Goal* (ppb)	Points of Compliance
ground water		chloroform			100	onsite wells: N1, N20, N24, N17,N16, N25,N28,N85, N8, PW7,PW3, PW9, PW12, PW2, PW13, PW1,PW8, PW11
		methylene chloride			5.4	
		methyl chloride			1.9	
		tetrachloroethene			5	
		trichloroethene			5	
		trichlorofluoro-methane			1,300	
		vinyl chloride			2	offsite wells: N4, N1, N3, N10, N13, NWWA7, N12, NWWA 23
		1,1-dichloro-ethene			7	
		1,2-dichloro-ethene (cis)			70	
		1,2-dichloro-ethene (trans)			100	
		1,2- DCA			5	
		1,2-TCA			200	

* Based on MCLs or 10^{-6} cancer risk level

EXPOSURE PATHWAYS

The company has identified and investigated a total of 20 Potential Source Areas (PSAs), of which 14 have been designated as known source areas of contamination. These known areas of contamination are: Building 20 Chloroform Tanks and Delivery Valve (PSA 1a); Building 20 Trench (PSA 1b); Industrial Sewer (PSA 1c); Building 69 Chloroform Transfer Station (PSA 2a); Detention Basin No. 2 (PSA 3); Waste Treatment Sludge Lagoons (PSA 4a); Storm Sewer (PSA 4b); Drum Collection Area (PSA 5); Building 9 (PSA 6); Waste-Oil Storage Tank (PSA 7a); Building 28 (PSA 9); Building 20 Drum Storage Area (PSA 10a); Closed Landfill (PSA 11); and N31 Region (PSA 12b). The ground water at the facility poses the greatest risk to human health when exposure occurs through ingestion of ground water or from inhalation of vapors from the ground water. In addition, chemical analyses of the waste material in the landfill indicate the presence of contaminants which make it necessary for the EPA to impose certain restrictions as part of the corrective measure alternatives to prevent future harmful exposures to humans.

SELECTED REMEDY

The selected remedial action for this site includes operating nine ground-water extraction wells and two in situ vapor extraction (ISV) units at the facility. The operation of the ground-water extraction wells will prevent contaminant migration over the entire facility. The contaminated ground water will be treated to meet specific health-based media cleanup standards. The operation of the ISV units will remove contaminants that are trapped within the unsaturated bedrock beneath the facility. A pilot study of the ISV units will be conducted in order to select, subject to EPAs approval, the most efficient operational schedule for the ISV units. The selected remedy also includes placing operational and maintenance restrictions on the former landfill at the facility which will require that the landfill remain non-operational unless written approval is obtained from the EPA prior to reopening and that the existing soil cap and hydraulic systems be maintained. These institutional controls will be implemented in order to prevent potential risks associated with contacting contaminated waste materials as well as the migration of contaminated ground water. In addition, periodic sampling and analysis of ground water collected from the remaining properties within 2,500 feet of the site which currently depend on ground water as their principle source of potable water must be conducted.

This selected remedy has a capital cost of $500,400 and an annual O&M cost of $1,275,000.

INNOVATIVE TECHNOLOGIES CONSIDERED

None.

PUBLIC PARTICIPATION

EPA held a 30-day public comment period which began on August 19, 1993, and extended through September 20, 1993. Comments received by EPA during the period did not propose any additional corrective measure alternatives and did not suggest any need to change EPA's preferred corrective measure. EPA received both verbal and written comments from residents, council members of the North Wales Borough, officials of the North Wales Water Authority, and Merck & Company.

NEXT STEPS

Merck & Company will proceed with the implementation of the pilot study as well as the rest of the selected remedy. Following a 2-year period from the commencement of the pilot study, Merck must submit to EPA a Two Year Evaluation Report which will evaluate the success of the first two years of the operation as a whole as well as the continued operation of the two ISV units. At this time, the EPA will make a decision regarding the operational status of the two ISV units.

KEYWORDS
Ground water, soil; ingestion (gw), inhalation; VOCs, DCA; institutional controls, monitoring (gw), vapor extraction.

CONTACT
Mr. Kai Hon Shum
U.S. EPA, Region III (3HW64)
841 Chestnut Building
Philadelphia, PA 19107
(215 597-2381